

20221Y



SEQUENCE LISTING

<110> Anthony Rosen  
Donald W. Nicholson  
Livia Casciola-Rosen  
Felipe A. Andrade  
Sophie Roy  
Nancy A. Thornberry

<120> AUTOANTIGENIC FRAGMENTS, METHODS AND  
ASSAYS

<130> 20221Y

<140> 09/296,662

<141> 1999-04-22

<150> PCT/US99/08774

<151> 1999-04-22

<150> 60/000,060

<151> 1998-04-22

F, <160> 37

<170> FastSEQ for Windows Version 4.0

<210> 1

<211> 4

<212> PRT

<213> Human

<400> 1

Asp Glu Val Asp

1

<210> 2

<211> 4

<212> PRT

<213> Human

<400> 2

Ile Glu Ala Asp

1

<210> 3

<211> 5

<212> PRT

<213> Human

<400> 3

Val Ala Thr Asp Ala

1

5

<210> 4

RECEIVED

APR 16 2003

TECH CENTER 1600/2900

<211> 5  
<212> PRT  
<213> Human

<400> 4  
Val Asp Pro Asp Tyr  
1 5

<210> 5  
<211> 5  
<212> PRT  
<213> Human

<400> 5  
Leu Glu Glu Asp Ala  
1 5

<210> 6  
<211> 5  
<212> PRT  
<213> Human

<400> 6  
Leu Thr Pro Asp Lys  
1 5

<210> 7  
<211> 5  
<212> PRT  
<213> Human

<400> 7  
Val Gly Pro Asp Gly  
1 5

<210> 8  
<211> 5  
<212> PRT  
<213> Human

<400> 8  
Val Asp Pro Asp Ser  
1 5

<210> 9  
<211> 5  
<212> PRT  
<213> Human

<400> 9  
Leu Gly Asn Asp Ser  
1 5

<210> 10  
<211> 5

<212> PRT  
<213> Human

<400> 10  
Val Glu Lys Asp Ser  
1 5

<210> 11  
<211> 5  
<212> PRT  
<213> Human

<400> 11  
Val Thr Pro Asp Gln  
1 5

<210> 12  
<211> 5  
<212> PRT  
<213> Human

F<sub>1</sub>  
<400> 12  
Leu Gly Pro Asp Glu  
1 5

<210> 13  
<211> 5  
<212> PRT  
<213> Human

<400> 13  
Val Ala Pro Asp Arg  
1 5

<210> 14  
<211> 5  
<212> PRT  
<213> Human

<400> 14  
Ile Cys Pro Asp Met  
1 5

<210> 15  
<211> 5  
<212> PRT  
<213> Human

<400> 15  
Val Cys Thr Asp Lys  
1 5

<210> 16  
<211> 5  
<212> PRT

<213> Human

<400> 16

Val Glu Gln Asp Met  
1 5

<210> 17

<211> 5

<212> PRT

<213> Human

<400> 17

Val Asp Ser Asp Glu  
1 5

<210> 18

<211> 5

<212> PRT

<213> Human

<400> 18

Ile Thr Pro Asp Pro  
1 5

<210> 19

<211> 5

<212> PRT

<213> Human

<400> 19

Val Thr Pro Asp Pro  
1 5

<210> 20

<211> 5

<212> PRT

<213> Human

<400> 20

Ile Ser Ser Asp Arg  
1 5

<210> 21

<211> 4

<212> PRT

<213> Human

<400> 21

Ile Cys Thr Asp  
1

<210> 22

<211> 4

<212> PRT

<213> Human

<400> 22  
Val Asp Val Asp  
1

<210> 23  
<211> 4  
<212> PRT  
<213> Human

<400> 23  
Ser Glu Val Asp  
1

<210> 24  
<211> 5  
<212> PRT  
<213> Human

<400> 24  
Val Gly Pro Asp Phe  
1 5

F  
1  
<210> 25  
<211> 5  
<212> PRT  
<213> Human

<400> 25  
Asp Glu Val Asp Asn  
1 5

<210> 26  
<211> 4  
<212> PRT  
<213> Human

<400> 26  
Tyr Val Ala Asp  
1

<210> 27  
<211> 5  
<212> PRT  
<213> Human

<400> 27  
Val Gly Pro Asp Ser  
1 5

<210> 28  
<211> 4  
<212> PRT  
<213> Human

<400> 28  
Ile Glu Thr Asp  
1

<210> 29  
<211> 5  
<212> PRT  
<213> Human

<400> 29  
Val Asp Gln Asp Gly  
1 5

<210> 30  
<211> 5  
<212> PRT  
<213> Human

<400> 30  
Val Leu Gly Asp Val  
1 5

<210> 31  
<211> 5  
<212> PRT  
<213> Human

<400> 31  
Asp Trp Val Asp Gly  
1 5

<210> 32  
<211> 2101  
<212> PRT  
<213> Human

<400> 32  
Met Thr Leu His Ala Thr Arg Gly Ala Ala Leu Leu Ser Trp Val Asn  
1 5 10 15  
Ser Leu His Val Ala Asp Pro Val Glu Ala Val Leu Gln Leu Gln Asp  
20 25 30  
Cys Ser Ile Phe Ile Lys Ile Ile Asp Arg Ile His Gly Thr Glu Glu  
35 40 45  
Gly Gln Gln Ile Leu Lys Gln Pro Val Ser Glu Arg Leu Asp Phe Val  
50 55 60  
Cys Ser Phe Leu Gln Lys Asn Arg Lys His Pro Ser Ser Pro Glu Cys  
65 70 75 80  
Leu Val Ser Ala Gln Lys Val Leu Glu Gly Ser Glu Leu Glu Leu Ala  
85 90 95  
Lys Met Thr Met Leu Leu Leu Tyr His Ser Thr Met Ser Ser Lys Ser  
100 105 110  
Pro Arg Asp Trp Glu Gln Phe Glu Tyr Lys Ile Gln Ala Glu Leu Ala  
115 120 125  
Val Ile Leu Lys Phe Val Leu Asp His Glu Asp Gly Leu Asn Leu Asn  
130 135 140

Glu Asp Leu Glu Asn Phe Leu Gln Lys Ala Pro Val Pro Ser Thr Cys  
 145 150 155 160  
 Ser Ser Thr Phe Pro Glu Glu Leu Ser Pro Pro Ser His Gln Ala Lys  
 165 170 175  
 Arg Glu Ile Arg Phe Leu Glu Leu Gln Lys Val Ala Ser Ser Ser Ser  
 180 185 190  
 Gly Asn Asn Phe Leu Ser Gly Ser Pro Ala Ser Pro Met Gly Asp Ile  
 195 200 205  
 Leu Gln Thr Pro Gln Phe Gln Met Arg Arg Leu Lys Lys Gln Leu Ala  
 210 215 220  
 Asp Glu Arg Ser Asn Arg Asp Glu Leu Glu Leu Glu Ala Glu Asn  
 225 230 235 240  
 Arg Lys Leu Leu Thr Glu Lys Asp Ala Gln Ile Ala Met Met Gln Gln  
 245 250 255  
 Arg Ile Asp Arg Leu Ala Leu Leu Asn Glu Lys Gln Ala Ala Ser Pro  
 260 265 270  
 Leu Glu Pro Lys Glu Leu Glu Glu Leu Arg Asp Lys Asn Glu Ser Leu  
 275 280 285  
 Thr Met Arg Leu His Glu Thr Leu Lys Gln Cys Gln Asp Leu Lys Thr  
 290 295 300  
 Glu Lys Ser Gln Met Asp Arg Lys Ile Asn Gln Leu Ser Glu Glu Asn  
 305 310 315 320  
 Gly Asp Leu Ser Phe Lys Leu Arg Glu Phe Ala Ser His Leu Gln Gln  
 325 330 335  
 Leu Gln Asp Ala Leu Asn Glu Leu Thr Glu Glu His Ser Lys Ala Thr  
 340 345 350  
 Gln Glu Trp Leu Glu Lys Gln Ala Gln Leu Glu Lys Glu Leu Ser Ala  
 355 360 365  
 Ala Leu Gln Asp Lys Lys Cys Leu Glu Glu Lys Asn Glu Ile Leu Gln  
 370 375 380  
 Gly Lys Leu Ser Gln Leu Glu Glu His Leu Ser Gln Leu Gln Asp Asn  
 385 390 395 400  
 Pro Pro Gln Glu Lys Gly Glu Val Leu Gly Asp Val Leu Gln Leu Glu  
 405 410 415  
 Thr Leu Lys Gln Glu Ala Ala Thr Leu Ala Ala Asn Asn Thr Gln Leu  
 420 425 430  
 Gln Ala Arg Val Glu Met Leu Glu Thr Glu Arg Gly Gln Gln Glu Ala  
 435 440 445  
 Lys Leu Leu Ala Glu Arg Gly His Phe Glu Glu Glu Lys Gln Gln Leu  
 450 455 460  
 Ser Ser Leu Ile Thr Asp Leu Gln Ser Ser Ile Ser Asn Leu Ser Gln  
 465 470 475 480  
 Ala Lys Glu Glu Leu Glu Gln Ala Ser Gln Ala His Gly Ala Arg Leu  
 485 490 495  
 Thr Ala Gln Val Ala Ser Leu Thr Ser Glu Leu Thr Thr Leu Asn Ala  
 500 505 510  
 Thr Ile Gln Gln Gln Asp Gln Glu Leu Ala Gly Leu Lys Gln Gln Ala  
 515 520 525  
 Lys Glu Lys Gln Ala Gln Leu Ala Gln Thr Leu Gln Gln Gln Glu Gln  
 530 535 540  
 Ala Ser Gln Gly Leu Arg His Gln Val Glu Gln Leu Ser Ser Ser Leu  
 545 550 555 560  
 Lys Gln Lys Glu Gln Gln Leu Lys Glu Val Ala Glu Lys Gln Glu Ala  
 565 570 575

Thr Arg Gln Asp His Ala Gln Gln Leu Ala Thr Ala Ala Glu Glu Arg  
 580 585 590  
 Glu Ala Ser Leu Arg Glu Arg Asp Ala Ala Leu Lys Gln Leu Glu Ala  
 595 600 605  
 Leu Glu Lys Glu Lys Ala Ala Lys Leu Glu Ile Leu Gln Gln Gln Leu  
 610 615 620  
 Gln Val Ala Asn Glu Ala Arg Asp Ser Ala Gln Thr Ser Val Thr Gln  
 625 630 635 640  
 Ala Gln Arg Glu Lys Ala Glu Leu Ser Arg Lys Val Glu Glu Leu Gln  
 645 650 655  
 Ala Cys Val Glu Thr Ala Arg Gln Glu Gln His Glu Ala Gln Ala Gln  
 660 665 670  
 Val Ala Glu Leu Glu Leu Gln Leu Arg Ser Glu Gln Gln Lys Ala Thr  
 675 680 685  
 Glu Lys Glu Arg Val Ala Gln Glu Lys Asp Gln Leu Gln Glu Gln Leu  
 690 695 700  
 Gln Ala Leu Lys Glu Ser Leu Lys Val Thr Lys Gly Ser Leu Glu Glu  
 705 710 715 720  
 Glu Lys Arg Arg Ala Ala Asp Ala Leu Glu Glu Gln Gln Arg Cys Ile  
 725 730 735  
 Ser Glu Leu Lys Ala Glu Thr Arg Ser Leu Val Glu Gln His Lys Arg  
 740 745 750  
 Glu Arg Lys Glu Leu Glu Glu Glu Arg Ala Gly Arg Lys Gly Leu Glu  
 755 760 765  
 Ala Arg Leu Leu Gln Leu Gly Glu Ala His Gln Ala Glu Thr Glu Val  
 770 775 780  
 Leu Arg Arg Glu Leu Ala Glu Ala Met Ala Ala Gln His Thr Ala Glu  
 785 790 795 800  
 Ser Glu Cys Glu Gln Leu Val Lys Glu Val Ala Ala Trp Arg Asp Gly  
 805 810 815  
 Tyr Glu Asp Ser Gln Gln Glu Glu Ala Gln Tyr Gly Ala Met Phe Gln  
 820 825 830  
 Glu Gln Leu Met Thr Leu Lys Glu Glu Cys Glu Lys Ala Arg Gln Glu  
 835 840 845  
 Leu Gln Glu Ala Lys Glu Lys Val Ala Gly Ile Glu Ser His Ser Glu  
 850 855 860  
 Leu Gln Ile Ser Arg Gln Gln Asn Lys Leu Ala Glu Leu His Ala Asn  
 865 870 875 880  
 Leu Ala Arg Ala Leu Gln Gln Val Gln Glu Lys Glu Val Arg Ala Gln  
 885 890 895  
 Lys Leu Ala Asp Asp Leu Ser Thr Leu Gln Glu Lys Met Ala Ala Thr  
 900 905 910  
 Ser Lys Glu Val Ala Arg Leu Glu Thr Leu Val Arg Lys Ala Gly Glu  
 915 920 925  
 Gln Gln Glu Thr Ala Ser Arg Glu Leu Val Lys Glu Pro Ala Arg Ala  
 930 935 940  
 Gly Asp Arg Gln Pro Glu Trp Leu Glu Glu Gln Gln Gly Arg Gln Phe  
 945 950 955 960  
 Cys Ser Thr Gln Ala Ala Leu Gln Ala Met Glu Arg Glu Ala Glu Gln  
 965 970 975  
 Met Gly Asn Glu Leu Glu Arg Leu Arg Ala Ala Leu Met Glu Ser Gln  
 980 985 990  
 Gly Gln Gln Gln Glu Glu Arg Gly Gln Gln Glu Arg Glu Val Ala Arg  
 995 1000 1005



Leu Thr Gln Glu Arg Gly Arg Ala Gln Ala Asp Leu Ala Leu Glu Lys  
 1010 1015 1020  
 Ala Ala Arg Ala Glu Leu Glu Met Arg Leu Gln Asn Ala Leu Asn Glu  
 1025 1030 1035 1040  
 Gln Arg Val Glu Phe Ala Thr Leu Gln Glu Ala Leu Ala His Ala Leu  
 1045 1050 1055  
 Thr Glu Lys Glu Gly Lys Asp Gln Glu Leu Ala Lys Leu Arg Gly Leu  
 1060 1065 1070  
 Glu Ala Ala Gln Ile Lys Glu Leu Glu Glu Leu Arg Gln Thr Val Lys  
 1075 1080 1085  
 Gln Leu Lys Glu Gln Leu Ala Lys Lys Glu Lys Glu His Ala Ser Gly  
 1090 1095 1100  
 Ser Gly Ala Gln Ser Glu Ala Ala Gly Arg Thr Glu Pro Thr Gly Pro  
 1105 1110 1115 1120  
 Lys Leu Glu Ala Leu Arg Ala Glu Val Ser Lys Leu Glu Gln Gln Cys  
 1125 1130 1135  
 Gln Lys Gln Gln Glu Gln Ala Asp Ser Leu Glu Arg Ser Leu Glu Ala  
 1140 1145 1150  
 Glu Arg Ala Ser Arg Ala Glu Arg Asp Ser Ala Leu Glu Thr Leu Gln  
 1155 1160 1165  
 Gly Gln Leu Glu Glu Lys Ala Gln Glu Leu Gly His Ser Gln Ser Ala  
 1170 1175 1180  
 Leu Ala Ser Ala Gln Arg Glu Leu Ala Ala Phe Arg Thr Lys Val Gln  
 1185 1190 1195 1200  
 Asp His Ser Lys Ala Glu Asp Glu Trp Lys Ala Gln Val Ala Arg Gly  
 1205 1210 1215  
 Arg Gln Glu Ala Glu Arg Lys Asn Ser Leu Ile Ser Ser Leu Glu Glu  
 1220 1225 1230  
 Glu Val Ser Ile Leu Asn Arg Gln Val Leu Glu Lys Glu Gly Glu Ser  
 1235 1240 1245  
 Lys Glu Leu Lys Arg Leu Val Met Ala Glu Ser Glu Lys Ser Gln Lys  
 1250 1255 1260  
 Leu Glu Glu Ser Cys Ala Cys Cys Arg Gln Arg Gln Pro Ala Thr Val  
 1265 1270 1275 1280  
 Pro Glu Leu Gln Asn Ala Ala Leu Leu Cys Gly Arg Arg Cys Arg Ala  
 1285 1290 1295  
 Ser Gly Arg Glu Ala Glu Lys Gln Arg Val Ala Ser Glu Asn Leu Arg  
 1300 1305 1310  
 Gln Glu Leu Thr Ser Gln Ala Glu Arg Ala Glu Glu Leu Gly Gln Glu  
 1315 1320 1325  
 Leu Lys Ala Trp Gln Glu Lys Phe Phe Gln Lys Glu Gln Ala Leu Ser  
 1330 1335 1340  
 Thr Leu Gln Leu Glu His Thr Ser Thr Gln Ala Leu Val Ser Glu Leu  
 1345 1350 1355 1360  
 Leu Pro Ala Lys His Leu Cys Gln Gln Leu Gln Ala Glu Gln Ala Ala  
 1365 1370 1375  
 Ala Glu Lys Arg His Arg Glu Glu Leu Glu Gln Ser Lys Gln Ala Ala  
 1380 1385 1390  
 Gly Gly Leu Arg Ala Glu Leu Leu Arg Ala Gln Arg Glu Leu Gly Glu  
 1395 1400 1405  
 Leu Ile Pro Leu Arg Gln Lys Val Ala Glu Gln Glu Arg Thr Ala Gln  
 1410 1415 1420  
 Gln Leu Arg Ala Glu Lys Ala Ser Tyr Ala Glu Gln Leu Ser Met Leu  
 1425 1430 1435 1440

Lys Lys Ala His Gly Leu Leu Ala Glu Glu Asn Arg Gly Leu Gly Glu  
 1445 1450 1455  
 Arg Ala Asn Leu Gly Arg Gln Phe Leu Glu Val Glu Leu Asp Gln Ala  
 1460 1465 1470  
 Arg Glu Lys Tyr Val Gln Glu Leu Ala Ala Val Arg Ala Asp Ala Glu  
 1475 1480 1485  
 Thr Arg Leu Ala Glu Val Gln Arg Glu Ala Gln Ser Thr Ala Arg Glu  
 1490 1495 1500  
 Leu Glu Val Met Thr Ala Lys Tyr Glu Gly Ala Lys Val Lys Val Leu  
 1505 1510 1515 1520  
 Glu Glu Arg Gln Arg Phe Gln Glu Glu Arg Gln Lys Leu Thr Ala Gln  
 1525 1530 1535  
 Val Glu Glu Leu Ser Lys Lys Leu Ala Asp Ser Asp Gln Ala Ser Lys  
 1540 1545 1550  
 Val Gln Gln Gln Lys Leu Lys Ala Val Gln Ala Gln Gly Glu Ser  
 1555 1560 1565  
 Gln Gln Glu Ala Gln Arg Phe Gln Ala Gln Leu Asn Glu Leu Gln Ala  
 1570 1575 1580  
 Gln Leu Ser Gln Lys Glu Gln Ala Ala Glu His Tyr Lys Leu Gln Met  
 1585 1590 1595 1600  
 Glu Lys Ala Lys Thr His Tyr Asp Ala Lys Lys Gln Gln Asn Gln Glu  
 1605 1610 1615  
 Leu Gln Glu Gln Leu Arg Ser Leu Glu Gln Leu Gln Lys Glu Asn Lys  
 1620 1625 1630  
 Glu Leu Arg Ala Glu Ala Glu Arg Leu Gly His Glu Leu Gln Gln Ala  
 1635 1640 1645  
 Gly Leu Lys Thr Lys Glu Ala Glu Gln Thr Cys Arg His Leu Thr Ala  
 1650 1655 1660  
 Gln Val Arg Ser Leu Glu Ala Gln Val Ala His Ala Asp Gln Gln Leu  
 1665 1670 1675 1680  
 Arg Asp Leu Gly Lys Phe Gln Val Ala Thr Asp Ala Leu Lys Ser Arg  
 1685 1690 1695  
 Glu Pro Gln Ala Lys Pro Gln Leu Asp Leu Ser Ile Asp Ser Leu Asp  
 1700 1705 1710  
 Leu Ser Cys Glu Glu Gly Thr Pro Leu Ser Ile Thr Ser Lys Leu Pro  
 1715 1720 1725  
 Arg Thr Gln Pro Asp Gly Thr Ser Val Pro Gly Glu Pro Ala Ser Pro  
 1730 1735 1740  
 Ile Ser Gln Arg Leu Pro Pro Lys Val Glu Ser Leu Glu Ser Leu Tyr  
 1745 1750 1755 1760  
 Phe Thr Pro Ile Pro Ala Arg Ser Gln Ala Pro Leu Glu Ser Ser Leu  
 1765 1770 1775  
 Asp Ser Leu Gly Asp Val Phe Leu Asp Ser Gly Arg Lys Thr Arg Ser  
 1780 1785 1790  
 Ala Arg Arg Arg Thr Thr Gln Ile Ile Asn Ile Thr Met Thr Lys Lys  
 1795 1800 1805  
 Leu Asp Val Glu Glu Pro Asp Ser Ala Asn Ser Ser Phe Tyr Ser Thr  
 1810 1815 1820  
 Arg Ser Ala Pro Ala Ser Gln Ala Ser Leu Arg Ala Thr Ser Ser Thr  
 1825 1830 1835 1840  
 Gln Ser Leu Ala Arg Leu Gly Ser Pro Asp Tyr Gly Asn Ser Ala Leu  
 1845 1850 1855  
 Leu Ser Leu Pro Gly Tyr Arg Pro Thr Thr Arg Ser Ser Ala Arg Arg  
 1860 1865 1870

Ser Gln Ala Gly Val Ser Ser Gly Ala Pro Pro Gly Arg Asn Ser Phe  
 1875 1880 1885  
 Tyr Met Gly Thr Cys Gln Asp Glu Pro Glu Gln Leu Asp Asp Trp Asn  
 1890 1895 1900  
 Arg Ile Ala Glu Leu Gln Gln Arg Asn Arg Val Cys Pro Pro His Leu  
 1905 1910 1915 1920  
 Lys Thr Cys Tyr Pro Leu Glu Ser Arg Pro Ser Leu Ser Leu Gly Thr  
 1925 1930 1935  
 Ile Thr Asp Glu Met Lys Thr Gly Asp Pro Gln Glu Thr Leu Arg  
 1940 1945 1950  
 Arg Ala Ser Met Gln Pro Ile Gln Ile Ala Glu Gly Thr Gly Ile Thr  
 1955 1960 1965  
 Thr Arg Gln Gln Arg Lys Arg Val Ser Leu Glu Pro His Gln Gly Pro  
 1970 1975 1980  
 Gly Thr Pro Glu Ser Lys Lys Ala Thr Ser Cys Phe Pro Arg Pro Met  
 1985 1990 1995 2000  
 Thr Pro Arg Asp Arg His Glu Gly Arg Lys Gln Ser Thr Thr Glu Ala  
 2005 2010 2015  
 Gln Lys Lys Ala Ala Pro Ala Ser Thr Lys Gln Ala Asp Arg Arg Gln  
 2020 2025 2030  
 Ser Met Ala Phe Ser Ile Leu Asn Thr Pro Lys Lys Leu Gly Asn Ser  
 2035 2040 2045  
 Leu Leu Arg Arg Gly Ala Ser Lys Lys Ala Leu Ser Lys Ala Ser Pro  
 2050 2055 2060  
 Asn Thr Arg Ser Gly Thr Arg Arg Ser Pro Arg Ile Ala Thr Thr Thr  
 2065 2070 2075 2080  
 Ala Ser Ala Ala Thr Ala Ala Ala Ile Gly Ala Thr Pro Arg Ala Lys  
 2085 2090 2095  
 Gly Lys Ala Lys His  
 2100

<210> 33  
 <211> 2115  
 <212> PRT  
 <213> Human

<400> 33  
 Met Thr Leu His Ala Thr Arg Gly Ala Ala Leu Leu Ser Trp Val Asn  
 1 5 10 15  
 Ser Leu His Val Ala Asp Pro Val Glu Ala Val Leu Gln Leu Gln Asp  
 20 25 30  
 Cys Ser Ile Phe Ile Lys Ile Ile Asp Arg Ile His Gly Thr Glu Glu  
 35 40 45  
 Gly Gln Gln Ile Leu Lys Gln Pro Val Ser Glu Arg Leu Asp Phe Val  
 50 55 60  
 Cys Ser Phe Leu Gln Lys Asn Arg Lys His Pro Ser Ser Pro Glu Cys  
 65 70 75 80  
 Leu Val Ser Ala Gln Lys Val Leu Glu Gly Ser Glu Leu Glu Leu Ala  
 85 90 95  
 Lys Met Thr Met Leu Leu Leu Tyr His Ser Thr Met Ser Ser Lys Ser  
 100 105 110  
 Pro Arg Asp Trp Glu Gln Phe Glu Tyr Lys Ile Gln Ala Glu Leu Ala  
 115 120 125  
 Val Ile Leu Lys Phe Val Leu Asp His Glu Asp Gly Leu Asn Leu Asn  
 130 135 140

Glu Asp Leu Glu Asn Phe Leu Gln Lys Ala Pro Val Pro Ser Thr Cys  
 145 150 155 160  
 Ser Ser Thr Phe Pro Glu Glu Leu Ser Pro Pro Ser His Gln Ala Lys  
 165 170 175  
 Arg Glu Ile Arg Phe Leu Glu Leu Gln Lys Val Ala Ser Ser Ser Ser  
 180 185 190  
 Gly Asn Asn Phe Leu Ser Gly Ser Pro Ala Ser Pro Met Gly Asp Ile  
 195 200 205  
 Leu Gln Thr Pro Gln Phe Gln Met Arg Arg Leu Lys Lys Gln Leu Ala  
 210 215 220  
 Asp Glu Arg Ser Asn Arg Asp Glu Leu Glu Leu Glu Leu Ala Glu Asn  
 225 230 235 240  
 Arg Lys Leu Leu Thr Glu Lys Asp Ala Gln Ile Ala Met Met Gln Gln  
 245 250 255  
 Arg Ile Asp Arg Leu Ala Leu Leu Asn Glu Lys Gln Ala Ala Ser Pro  
 260 265 270  
 Leu Glu Pro Lys Glu Leu Glu Glu Leu Arg Asp Lys Asn Glu Ser Leu  
 275 280 285  
 Thr Met Arg Leu His Glu Thr Leu Lys Gln Cys Gln Asp Leu Lys Thr  
 290 295 300  
 Glu Lys Ser Gln Met Asp Arg Lys Ile Asn Gln Leu Ser Glu Glu Asn  
 305 310 315 320  
 Gly Asp Leu Ser Phe Lys Leu Arg Glu Phe Ala Ser His Leu Gln Gln  
 325 330 335  
 Leu Gln Asp Ala Leu Asn Glu Leu Thr Glu Glu His Ser Lys Ala Thr  
 340 345 350  
 Gln Glu Trp Leu Glu Lys Gln Ala Gln Leu Glu Lys Glu Leu Ser Ala  
 355 360 365  
 Ala Leu Gln Asp Lys Lys Cys Leu Glu Glu Lys Asn Glu Ile Leu Gln  
 370 375 380  
 Gly Lys Leu Ser Gln Leu Glu Glu His Leu Ser Gln Leu Gln Asp Asn  
 385 390 395 400  
 Pro Pro Gln Glu Lys Gly Glu Val Leu Gly Asp Val Leu Gln Leu Glu  
 405 410 415  
 Thr Leu Lys Gln Glu Ala Ala Thr Leu Ala Ala Asn Asn Thr Gln Leu  
 420 425 430  
 Gln Ala Arg Val Glu Met Leu Glu Thr Glu Arg Gly Gln Gln Glu Ala  
 435 440 445  
 Lys Leu Leu Ala Glu Arg Gly His Phe Glu Glu Glu Lys Gln Gln Leu  
 450 455 460  
 Ser Ser Leu Ile Thr Asp Leu Gln Ser Ser Ile Ser Asn Leu Ser Gln  
 465 470 475 480  
 Ala Lys Glu Glu Leu Glu Gln Ala Ser Gln Ala His Gly Ala Arg Leu  
 485 490 495  
 Thr Ala Gln Val Ala Ser Leu Thr Ser Glu Leu Thr Thr Leu Asn Ala  
 500 505 510  
 Thr Ile Gln Gln Gln Asp Gln Glu Leu Ala Gly Leu Lys Gln Gln Ala  
 515 520 525  
 Lys Glu Lys Gln Ala Gln Leu Ala Gln Thr Leu Gln Gln Gln Glu Gln  
 530 535 540  
 Ala Ser Gln Gly Leu Arg His Gln Val Glu Gln Leu Ser Ser Ser Leu  
 545 550 555 560  
 Lys Gln Lys Glu Gln Gln Leu Lys Glu Val Ala Glu Lys Gln Glu Ala  
 565 570 575

Thr Arg Gln Asp His Ala Gln Gln Leu Ala Thr Ala Ala Glu Glu Arg  
 580 585 590  
 Glu Ala Ser Leu Arg Glu Arg Asp Ala Ala Leu Lys Gln Leu Glu Ala  
 595 600 605  
 Leu Glu Lys Glu Lys Ala Ala Lys Leu Glu Ile Leu Gln Gln Gln Leu  
 610 615 620  
 Gln Val Ala Asn Glu Ala Arg Asp Ser Ala Gln Thr Ser Val Thr Gln  
 625 630 635 640  
 Ala Gln Arg Glu Lys Ala Glu Leu Ser Arg Lys Val Glu Glu Leu Gln  
 645 650 655  
 Ala Cys Val Glu Thr Ala Arg Gln Glu Gln His Glu Ala Gln Ala Gln  
 660 665 670  
 Val Ala Glu Leu Glu Leu Gln Leu Arg Ser Glu Gln Gln Lys Ala Thr  
 675 680 685  
 Glu Lys Glu Arg Val Ala Gln Glu Lys Asp Gln Leu Gln Glu Gln Leu  
 690 695 700  
 Gln Ala Leu Lys Glu Ser Leu Lys Val Thr Lys Gly Ser Leu Glu Glu  
 705 710 715 720  
 Glu Lys Arg Arg Ala Ala Asp Ala Leu Glu Glu Gln Gln Arg Cys Ile  
 725 730 735  
 Ser Glu Leu Lys Ala Glu Thr Arg Ser Leu Val Glu Gln His Lys Arg  
 740 745 750  
 Glu Arg Lys Glu Leu Glu Glu Glu Arg Ala Gly Arg Lys Gly Leu Glu  
 755 760 765  
 Ala Arg Leu Gln Gln Leu Gly Glu Ala His Gln Ala Glu Thr Glu Val  
 770 775 780  
 Leu Arg Arg Glu Leu Ala Glu Ala Met Ala Ala Gln His Thr Ala Glu  
 785 790 795 800  
 Ser Glu Cys Glu Gln Leu Val Lys Glu Val Ala Ala Trp Arg Glu Arg  
 805 810 815  
 Tyr Glu Asp Ser Gln Gln Glu Glu Ala Gln Tyr Gly Ala Met Phe Gln  
 820 825 830  
 Glu Gln Leu Met Thr Leu Lys Glu Glu Cys Glu Lys Ala Arg Gln Glu  
 835 840 845  
 Leu Gln Glu Ala Lys Glu Lys Val Ala Gly Ile Glu Ser His Ser Glu  
 850 855 860  
 Leu Gln Ile Ser Arg Gln Gln Asn Glu Leu Ala Glu Leu His Ala Asn  
 865 870 875 880  
 Leu Ala Arg Ala Leu Gln Gln Val Gln Glu Lys Glu Val Arg Ala Gln  
 885 890 895  
 Lys Leu Ala Asp Asp Leu Ser Thr Leu Gln Glu Lys Met Ala Ala Thr  
 900 905 910  
 Ser Lys Glu Val Ala Arg Leu Glu Thr Leu Val Arg Lys Ala Gly Glu  
 915 920 925  
 Gln Gln Glu Thr Ala Ser Arg Glu Leu Val Lys Glu Pro Ala Arg Ala  
 930 935 940  
 Gly Asp Arg Gln Pro Glu Trp Leu Glu Glu Gln Gln Gly Arg Gln Phe  
 945 950 955 960  
 Cys Ser Thr Gln Ala Ala Leu Gln Ala Met Glu Arg Glu Ala Glu Gln  
 965 970 975  
 Met Gly Asn Glu Leu Glu Arg Leu Arg Ala Ala Leu Met Glu Ser Gln  
 980 985 990  
 Gly Gln Gln Gln Glu Glu Arg Gly Gln Gln Glu Arg Glu Val Ala Arg  
 995 1000 1005

Leu Thr Gln Glu Arg Gly Arg Ala Gln Ala Asp Leu Ala Leu Glu Lys  
 1010 1015 1020  
 Ala Ala Arg Ala Glu Leu Glu Met Arg Leu Gln Asn Ala Leu Asn Glu  
 1025 1030 1035 1040  
 Gln Arg Val Glu Phe Ala Thr Leu Gln Glu Ala Leu Ala His Ala Leu  
 1045 1050 1055  
 Thr Glu Lys Glu Gly Lys Asp Gln Glu Leu Ala Lys Leu Arg Gly Leu  
 1060 1065 1070  
 Glu Ala Ala Gln Ile Lys Glu Leu Glu Glu Leu Arg Gln Thr Val Lys  
 1075 1080 1085  
 Gln Leu Lys Glu Gln Leu Ala Lys Lys Glu Lys Glu His Ala Ser Gly  
 1090 1095 1100  
 Ser Gly Ala Gln Ser Glu Ala Ala Gly Arg Thr Glu Pro Thr Gly Pro  
 1105 1110 1115 1120  
 Lys Leu Glu Ala Leu Arg Ala Glu Val Ser Lys Leu Glu Gln Gln Cys  
 1125 1130 1135  
 Gln Lys Gln Gln Glu Gln Ala Asp Ser Leu Glu Arg Ser Leu Glu Ala  
 1140 1145 1150  
 Glu Arg Ala Ser Arg Ala Glu Arg Asp Ser Ala Leu Glu Thr Leu Gln  
 1155 1160 1165  
 Gly Gln Leu Glu Glu Lys Ala Gln Glu Leu Gly His Ser Gln Ser Ala  
 1170 1175 1180  
 Leu Ala Ser Ala Gln Arg Glu Leu Ala Ala Phe Arg Thr Lys Val Gln  
 1185 1190 1195 1200  
 Asp His Ser Lys Ala Glu Asp Glu Trp Lys Ala Gln Val Ala Arg Gly  
 1205 1210 1215  
 Arg Gln Glu Ala Glu Arg Lys Asn Ser Leu Ile Ser Ser Leu Glu Glu  
 1220 1225 1230  
 Glu Val Ser Ile Leu Asn Arg Gln Val Leu Glu Lys Glu Gly Glu Ser  
 1235 1240 1245  
 Lys Glu Leu Lys Arg Leu Val Met Ala Glu Ser Glu Lys Ser Gln Lys  
 1250 1255 1260  
 Leu Glu Glu Arg Leu Arg Leu Leu Gln Ala Glu Thr Ala Ser Asn Ser  
 1265 1270 1275 1280  
 Ala Arg Ala Ala Glu Arg Ser Ser Ala Leu Arg Glu Glu Val Gln Ser  
 1285 1290 1295  
 Leu Arg Glu Glu Ala Glu Lys Gln Arg Val Ala Ser Glu Asn Leu Arg  
 1300 1305 1310  
 Gln Glu Leu Thr Ser Gln Ala Glu Arg Ala Glu Glu Leu Gly Gln Glu  
 1315 1320 1325  
 Leu Lys Ala Trp Gln Glu Lys Phe Phe Gln Lys Glu Gln Ala Leu Ser  
 1330 1335 1340  
 Thr Leu Gln Leu Glu His Thr Ser Thr Gln Ala Leu Val Ser Glu Leu  
 1345 1350 1355 1360  
 Leu Pro Ala Lys His Leu Cys Gln Gln Leu Gln Ala Glu Gln Ala Ala  
 1365 1370 1375  
 Ala Glu Lys Arg His Arg Glu Glu Leu Glu Gln Ser Lys Gln Ala Ala  
 1380 1385 1390  
 Gly Gly Leu Arg Ala Glu Leu Leu Arg Ala Gln Arg Glu Leu Gly Glu  
 1395 1400 1405  
 Leu Ile Pro Leu Arg Gln Lys Val Ala Glu Gln Glu Arg Thr Ala Gln  
 1410 1415 1420  
 Gln Leu Arg Ala Glu Lys Ala Ser Tyr Ala Glu Gln Leu Ser Met Leu  
 1425 1430 1435 1440

Lys Lys Ala His Gly Leu Leu Ala Glu Glu Asn Arg Gly Leu Gly Glu  
 1445 1450 1455  
 Arg Ala Asn Leu Gly Arg Gln Phe Leu Glu Val Glu Leu Asp Gln Ala  
 1460 1465 1470  
 Arg Glu Lys Tyr Val Gln Glu Leu Ala Ala Val Arg Ala Asp Ala Glu  
 1475 1480 1485  
 Thr Arg Leu Ala Glu Val Gln Arg Glu Ala Gln Ser Thr Ala Arg Glu  
 1490 1495 1500  
 Leu Glu Val Met Thr Ala Lys Tyr Glu Gly Ala Lys Val Lys Val Leu  
 1505 1510 1515 1520  
 Glu Glu Arg Gln Arg Phe Gln Glu Glu Arg Gln Lys Leu Thr Ala Gln  
 1525 1530 1535  
 Val Glu Gln Leu Glu Val Phe Gln Arg Glu Gln Thr Lys Gln Val Glu  
 1540 1545 1550  
 Glu Leu Ser Lys Lys Leu Ala Asp Ser Asp Gln Ala Ser Lys Val Gln  
 1555 1560 1565  
 Gln Gln Lys Leu Lys Ala Val Gln Ala Gln Gly Gly Glu Ser Gln Gln  
 1570 1575 1580  
 Glu Ala Gln Arg Leu Gln Ala Gln Leu Asn Glu Leu Gln Ala Gln Leu  
 1585 1590 1595 1600  
 Ser Gln Lys Glu Gln Ala Ala Glu His Tyr Lys Leu Gln Met Glu Lys  
 1605 1610 1615  
 Ala Lys Thr His Tyr Asp Ala Lys Lys Gln Gln Asn Gln Glu Leu Gln  
 1620 1625 1630  
 Glu Gln Leu Arg Ser Leu Glu Gln Leu Gln Lys Glu Asn Lys Glu Leu  
 1635 1640 1645  
 Arg Ala Glu Ala Glu Arg Leu Gly His Glu Leu Gln Gln Ala Gly Leu  
 1650 1655 1660  
 Lys Thr Lys Glu Ala Glu Gln Thr Cys Arg His Leu Thr Ala Gln Val  
 1665 1670 1675 1680  
 Arg Ser Leu Glu Ala Gln Val Ala His Ala Asp Gln Gln Leu Arg Asp  
 1685 1690 1695  
 Leu Gly Lys Phe Gln Val Ala Thr Asp Ala Leu Lys Ser Arg Glu Pro  
 1700 1705 1710  
 Gln Ala Lys Pro Gln Leu Asp Leu Ser Ile Asp Ser Leu Asp Leu Ser  
 1715 1720 1725  
 Cys Glu Glu Gly Thr Pro Leu Ser Ile Thr Ser Lys Leu Pro Arg Thr  
 1730 1735 1740  
 Gln Pro Asp Gly Thr Ser Val Pro Gly Glu Pro Ala Ser Pro Ile Ser  
 1745 1750 1755 1760  
 Gln Arg Leu Pro Pro Lys Val Glu Ser Leu Glu Ser Leu Tyr Phe Thr  
 1765 1770 1775  
 Pro Ile Pro Ala Arg Ser Gln Ala Pro Leu Glu Ser Ser Leu Asp Ser  
 1780 1785 1790  
 Leu Gly Asp Val Phe Gln Asp Ser Gly Arg Lys Thr Arg Ser Ala Arg  
 1795 1800 1805  
 Arg Arg Thr Thr Gln Ile Ile Asn Ile Thr Met Thr Lys Lys Leu Asp  
 1810 1815 1820  
 Val Glu Glu Pro Asp Ser Ala Asn Ser Ser Phe Tyr Ser Thr Arg Ser  
 1825 1830 1835 1840  
 Ala Pro Ala Ser Gln Ala Ser Leu Arg Ala Thr Ser Ser Thr Gln Ser  
 1845 1850 1855  
 Leu Ala Arg Leu Gly Ser Pro Asp Tyr Gly Asn Ser Ala Leu Leu Ser  
 1860 1865 1870

Leu Pro Gly Tyr Arg Pro Thr Thr Arg Ser Ser Ala Arg Arg Ser Gln  
 1875 1880 1885  
 Ala Gly Val Ser Ser Gly Ala Pro Pro Gly Arg Asn Ser Phe Tyr Met  
 1890 1895 1900  
 Gly Thr Cys Gln Asp Glu Pro Glu Gln Leu Asp Asp Trp Asn Arg Ile  
 1905 1910 1915 1920  
 Ala Glu Leu Gln Gln Arg Asn Arg Val Cys Pro Pro His Leu Lys Thr  
 1925 1930 1935  
 Cys Tyr Pro Leu Glu Ser Arg Pro Ser Leu Ser Leu Gly Thr Ile Thr  
 1940 1945 1950  
 Asp Glu Glu Met Lys Thr Gly Asp Pro Gln Glu Thr Leu Arg Arg Ala  
 1955 1960 1965  
 Ser Met Gln Pro Ile Gln Ile Ala Glu Gly Thr Gly Ile Thr Thr Arg  
 1970 1975 1980  
 Gln Gln Arg Lys Arg Val Ser Leu Glu Pro His Gln Gly Pro Gly Thr  
 1985 1990 1995 2000  
 Pro Glu Ser Lys Lys Ala Thr Ser Cys Phe Pro Arg Pro Met Thr Pro  
 2005 2010 2015  
 Arg Asp Arg His Glu Gly Arg Lys Gln Ser Thr Thr Glu Ala Gln Lys  
 2020 2025 2030  
 Lys Ala Ala Pro Ala Ser Thr Lys Gln Ala Asp Arg Arg Gln Ser Met  
 2035 2040 2045  
 Ala Phe Ser Ile Leu Asn Thr Pro Lys Lys Leu Gly Asn Ser Leu Leu  
 2050 2055 2060  
 Arg Arg Gly Ala Ser Lys Lys Ala Leu Ser Lys Ala Ser Pro Asn Thr  
 2065 2070 2075 2080  
 Arg Ser Gly Thr Arg Arg Ser Pro Arg Ile Ala Thr Thr Thr Ala Ser  
 2085 2090 2095  
 Ala Ala Thr Ala Ala Ile Gly Ala Thr Pro Arg Ala Lys Gly Lys  
 2100 2105 2110  
 Ala Lys His  
 2115

<210> 34  
 <211> 4096  
 <212> PRT  
 <213> Human

<220>  
 <221> VARIANT  
 <222> (1)...(4096)  
 <223> Xaa = Any Amino Acid

<400> 34  
 Met Ala Gly Ser Gly Ala Gly Val Arg Cys Ser Leu Leu Arg Leu Gln  
 1 5 10 15  
 Glu Thr Leu Ser Ala Ala Asp Arg Cys Gly Ala Ala Leu Ala Gly His  
 20 25 30  
 Gln Leu Ile Arg Gly Leu Gly Gln Glu Cys Val Leu Ser Ser Ser Pro  
 35 40 45  
 Ala Val Leu Ala Leu Gln Thr Ser Leu Val Phe Ser Arg Asp Phe Gly  
 50 55 60  
 Leu Leu Val Phe Val Arg Lys Ser Leu Asn Ser Ile Glu Phe Arg Glu  
 65 70 75 80



Cys Arg Glu Glu Ile Leu Lys Phe Leu Cys Ile Phe Leu Glu Lys Met  
 85 90 95  
 Gly Gln Lys Ile Ala Pro Tyr Ser Val Glu Ile Lys Asn Thr Cys Thr  
 100 105 110  
 Ser Val Tyr Thr Lys Asp Arg Ala Lys Cys Lys Ile Pro Ala Leu  
 115 120 125  
 Asp Leu Leu Ile Lys Leu Leu Gln Thr Phe Arg Ser Ser Arg Leu Met  
 130 135 140  
 Asp Glu Phe Lys Ile Gly Glu Leu Phe Ser Lys Phe Tyr Gly Glu Leu  
 145 150 155 160  
 Ala Leu Lys Lys Lys Ile Pro Asp Thr Val Leu Glu Lys Val Tyr Glu  
 165 170 175  
 Leu Leu Gly Leu Leu Gly Glu Val His Pro Ser Glu Met Ile Asn Asn  
 180 185 190  
 Ala Glu Asn Leu Phe Arg Ala Phe Leu Gly Glu Leu Lys Thr Gln Met  
 195 200 205  
 Thr Ser Ala Val Arg Glu Pro Lys Leu Pro Val Leu Ala Gly Cys Leu  
 210 215 220  
 Lys Gly Leu Ser Ser Leu Leu Cys Asn Phe Thr Lys Ser Met Glu Glu  
 225 230 235 240  
 Asp Pro Gln Thr Ser Arg Glu Ile Phe Asn Phe Val Leu Lys Ala Ile  
 245 250 255  
 Arg Pro Gln Ile Asp Leu Lys Arg Tyr Ala Val Pro Ser Ala Gly Leu  
 260 265 270  
 Arg Leu Phe Ala Leu His Ala Ser Gln Phe Ser Thr Cys Leu Leu Asp  
 275 280 285  
 Asn Tyr Val Ser Leu Phe Glu Val Leu Ile Lys Trp Cys Ala His Thr  
 290 295 300  
 Asn Val Glu Leu Lys Lys Ala Ala Leu Ser Ala Leu Glu Ser Phe Leu  
 305 310 315 320  
 Lys Gln Val Ser Asn Met Val Ala Lys Asn Ala Glu Met His Lys Asn  
 325 330 335  
 Lys Leu Gln Tyr Glu Met Glu Gln Phe Tyr Gly Ile Ile Arg Asn Val  
 340 345 350  
 Asp Ser Asn Asn Lys Glu Leu Ser Ile Ala Ile Arg Gly Tyr Gly Leu  
 355 360 365  
 Phe Ala Gly Pro Cys Lys Val Ile Asn Ala Lys Asp Val Asp Phe Met  
 370 375 380  
 Tyr Val Glu Leu Ile Gln Arg Cys Lys Gln Met Phe Leu Thr Gln Thr  
 385 390 395 400  
 Asp Thr Gly Asp Tyr Arg Val Tyr Gln Met Pro Ser Phe Leu Gln Ser  
 405 410 415  
 Val Ala Ser Val Leu Leu Tyr Leu Asp Thr Val Pro Glu Val Tyr Thr  
 420 425 430  
 Pro Val Leu Glu His Leu Val Val Met Gln Ile Asp Ser Phe Pro Gln  
 435 440 445  
 Tyr Ser Pro Lys Met Gln Leu Val Cys Cys Arg Ala Ile Val Lys Val  
 450 455 460  
 Phe Leu Ala Leu Ala Ala Lys Gly Pro Val Leu Arg Asn Cys Ile Ser  
 465 470 475 480  
 Thr Val Val His Gln Gly Leu Ile Arg Ile Cys Ser Lys Pro Val Val  
 485 490 495  
 Leu Pro Lys Gly Pro Glu Ser Glu Ser Glu Asp His Arg Ala Ser Gly  
 500 505 510

Glu Val Arg Thr Gly Lys Trp Lys Val Pro Thr Tyr Lys Asp Tyr Val  
 515 520 525  
 Asp Leu Phe Arg His Leu Leu Ser Ser Asp Gln Met Met Asp Ser Ile  
 530 535 540  
 Leu Ala Asp Glu Ala Phe Phe Ser Val Asn Ser Ser Ser Glu Ser Leu  
 545 550 555 560  
 Asn His Leu Leu Tyr Asp Glu Phe Val Lys Ser Val Leu Lys Ile Val  
 565 570 575  
 Glu Lys Leu Asp Leu Thr Leu Glu Ile Gln Thr Val Gly Glu Gln Glu  
 580 585 590  
 Asn Gly Asp Glu Ala Pro Gly Val Trp Met Ile Pro Thr Ser Asp Pro  
 595 600 605  
 Ala Ala Asn Leu His Pro Ala Lys Pro Lys Asp Phe Ser Ala Phe Ile  
 610 615 620  
 Asn Leu Val Glu Phe Cys Arg Glu Ile Leu Pro Glu Lys Gln Ala Glu  
 625 630 635 640  
 Phe Phe Glu Pro Trp Val Tyr Ser Phe Ser Tyr Glu Leu Ile Leu Gln  
 645 650 655  
 Ser Thr Arg Leu Pro Leu Ile Ser Gly Phe Tyr Lys Leu Leu Ser Ile  
 660 665 670  
 Thr Val Arg Asn Ala Lys Lys Ile Lys Tyr Phe Glu Gly Val Ser Pro  
 675 680 685  
 Lys Ser Leu Lys His Ser Pro Glu Asp Pro Glu Lys Tyr Ser Cys Phe  
 690 695 700  
 Ala Leu Phe Val Lys Phe Gly Lys Glu Val Ala Val Lys Met Lys Gln  
 705 710 715 720  
 Tyr Lys Asp Glu Leu Leu Ala Ser Cys Leu Thr Phe Leu Leu Ser Leu  
 725 730 735  
 Pro His Asn Ile Ile Glu Leu Asp Val Arg Ala Tyr Val Pro Ala Leu  
 740 745 750  
 Gln Met Ala Phe Lys Leu Gly Leu Ser Tyr Thr Pro Leu Ala Glu Val  
 755 760 765  
 Gly Leu Asn Ala Leu Glu Glu Trp Ser Ile Tyr Ile Asp Arg His Val  
 770 775 780  
 Met Gln Pro Tyr Tyr Lys Asp Ile Leu Pro Cys Leu Asp Gly Tyr Leu  
 785 790 795 800  
 Lys Thr Ser Ala Leu Ser Asp Glu Thr Lys Asn Asn Trp Glu Val Ser  
 805 810 815  
 Ala Leu Ser Arg Ala Ala Gln Lys Gly Phe Asn Lys Val Val Leu Lys  
 820 825 830  
 His Leu Lys Lys Thr Lys Asn Leu Ser Ser Asn Glu Ala Ile Ser Leu  
 835 840 845  
 Glu Glu Ile Arg Ile Arg Val Val Gln Met Leu Gly Ser Leu Gly Gly  
 850 855 860  
 Gln Ile Asn Lys Asn Leu Leu Thr Val Thr Ser Ser Asp Glu Met Met  
 865 870 875 880  
 Lys Ser Tyr Val Ala Trp Asp Arg Glu Lys Arg Leu Ser Phe Ala Val  
 885 890 895  
 Pro Phe Arg Glu Met Lys Pro Val Ile Phe Leu Asp Val Phe Leu Pro  
 900 905 910  
 Arg Val Thr Glu Leu Ala Leu Thr Ala Ser Asp Arg Gln Thr Lys Val  
 915 920 925  
 Ala Ala Cys Glu Leu Leu His Ser Met Val Met Phe Met Leu Gly Lys  
 930 935 940

Ala Thr Gln Met Pro Glu Gly Gly Gln Gly Ala Pro Pro Met Tyr Gln  
 945 950 955 960  
 Leu Tyr Lys Arg Thr Phe Pro Val Leu Leu Arg Leu Ala Cys Asp Val  
 965 970 975  
 Asp Gln Val Thr Arg Gln Leu Tyr Glu Pro Leu Val Met Gln Leu Ile  
 980 985 990  
 His Trp Phe Thr Asn Asn Lys Lys Phe Glu Ser Gln Asp Thr Val Ser  
 995 1000 1005  
 Leu Leu Glu Ala Ile Leu Asp Gly Ile Val Asp Pro Val Asp Ser Thr  
 1010 1015 1020  
 Leu Arg Asp Phe Cys Gly Arg Cys Ile Arg Glu Phe Leu Lys Trp Ser  
 1025 1030 1035 1040  
 Ile Lys Gln Ile Thr Pro Gln Gln Gln Glu Lys Ser Pro Val Asn Thr  
 1045 1050 1055  
 Lys Ser Leu Phe Lys Arg Leu Tyr Ser Leu Ala Leu His Pro Asn Ala  
 1060 1065 1070  
 Phe Lys Arg Leu Gly Ala Ser Leu Ala Phe Asn Asn Ile Tyr Arg Glu  
 1075 1080 1085  
 Phe Arg Glu Glu Glu Ser Leu Val Glu Gln Phe Val Phe Glu Ala Leu  
 1090 1095 1100  
 Val Ile Tyr Met Glu Ser Leu Ala Leu Ala His Ala Asp Glu Lys Ser  
 1105 1110 1115 1120  
 Leu Gly Thr Ile Gln Gln Cys Cys Asp Ala Ile Asp His Leu Cys Arg  
 1125 1130 1135  
 Ile Ile Glu Lys Lys His Val Ser Leu Asn Lys Ala Lys Lys Arg Arg  
 1140 1145 1150  
 Leu Pro Arg Gly Phe Pro Pro Ser Ala Ser Leu Cys Leu Leu Asp Leu  
 1155 1160 1165  
 Val Lys Trp Leu Leu Ala His Cys Gly Arg Pro Gln Thr Glu Cys Arg  
 1170 1175 1180  
 His Lys Ser Ile Glu Leu Phe Tyr Lys Phe Val Pro Leu Leu Pro Gly  
 1185 1190 1195 1200  
 Asn Arg Ser Pro Asn Leu Trp Leu Lys Asp Val Leu Lys Glu Glu Gly  
 1205 1210 1215  
 Val Ser Phe Leu Ile Asn Thr Phe Glu Gly Gly Gly Cys Gly Gln Pro  
 1220 1225 1230  
 Ser Gly Ile Leu Ala Gln Pro Thr Leu Leu Tyr Leu Arg Gly Pro Phe  
 1235 1240 1245  
 Ser Leu Gln Ala Thr Leu Cys Trp Leu Asp Leu Leu Leu Ala Ala Leu  
 1250 1255 1260  
 Glu Cys Tyr Asn Thr Phe Ile Gly Glu Arg Thr Val Gly Ala Leu Gln  
 1265 1270 1275 1280  
 Val Leu Gly Thr Glu Ala Gln Ser Ser Leu Leu Lys Ala Val Ala Phe  
 1285 1290 1295  
 Phe Leu Glu Ser Ile Ala Met His Asp Ile Ile Ala Ala Glu Lys Cys  
 1300 1305 1310  
 Phe Gly Thr Gly Ala Ala Gly Asn Arg Thr Ser Pro Gln Glu Gly Glu  
 1315 1320 1325  
 Arg Tyr Asn Tyr Ser Lys Cys Thr Val Val Val Arg Ile Met Glu Phe  
 1330 1335 1340  
 Thr Thr Thr Leu Leu Asn Thr Ser Pro Glu Gly Trp Lys Leu Leu Lys  
 1345 1350 1355 1360  
 Lys Asp Leu Cys Asn Thr His Leu Met Arg Val Leu Val Gln Thr Leu  
 1365 1370 1375

Cys Glu Pro Ala Ser Ile Gly Phe Asn Ile Gly Asp Val Gln Val Met  
 1380 1385 1390  
 Ala His Leu Pro Asp Val Cys Val Asn Leu Met Lys Ala Leu Lys Met  
 1395 1400 1405  
 Ser Pro Tyr Lys Asp Ile Leu Glu Thr His Leu Arg Glu Lys Ile Thr  
 1410 1415 1420  
 Ala Gln Ser Ile Glu Glu Leu Cys Ala Val Asn Leu Tyr Gly Pro Asp  
 1425 1430 1435 1440  
 Ala Gln Val Asp Arg Ser Arg Leu Ala Ala Val Val Ser Ala Cys Lys  
 1445 1450 1455  
 Gln Leu His Arg Ala Gly Leu Leu His Asn Ile Leu Pro Ser Gln Ser  
 1460 1465 1470  
 Thr Asp Leu His His Ser Val Gly Thr Glu Leu Leu Ser Leu Val Tyr  
 1475 1480 1485  
 Lys Gly Ile Ala Pro Gly Asp Glu Arg Gln Cys Leu Pro Ser Leu Asp  
 1490 1495 1500  
 Leu Ser Cys Lys Gln Leu Ala Ser Gly Leu Leu Glu Leu Ala Phe Ala  
 1505 1510 1515 1520  
 Phe Gly Gly Leu Cys Glu Arg Leu Val Ser Leu Leu Leu Asn Pro Ala  
 1525 1530 1535  
 Val Leu Ser Thr Ala Ser Leu Gly Ser Ser Gln Gly Ser Val Ile His  
 1540 1545 1550  
 Phe Ser His Gly Glu Tyr Phe Tyr Ser Leu Phe Ser Glu Thr Ile Asn  
 1555 1560 1565  
 Thr Glu Leu Leu Lys Asn Leu Asp Leu Ala Val Leu Glu Leu Met Gln  
 1570 1575 1580  
 Ser Ser Val Asp Asn Thr Lys Met Val Ser Ala Val Leu Asn Gly Met  
 1585 1590 1595 1600  
 Leu Asp Gln Ser Phe Arg Glu Arg Ala Asn Gln Lys His Gln Gly Leu  
 1605 1610 1615  
 Lys Leu Ala Thr Thr Ile Leu Gln His Trp Lys Lys Cys Asp Ser Trp  
 1620 1625 1630  
 Trp Ala Lys Asp Ser Pro Leu Glu Thr Lys Met Ala Val Leu Ala Leu  
 1635 1640 1645  
 Leu Ala Lys Ile Leu Gln Ile Asp Ser Ser Val Ser Phe Asn Thr Ser  
 1650 1655 1660  
 His Gly Ser Phe Pro Glu Val Phe Thr Thr Tyr Ile Ser Leu Leu Ala  
 1665 1670 1675 1680  
 Asp Thr Lys Leu Asp Leu His Leu Lys Gly Gln Ala Val Thr Leu Leu  
 1685 1690 1695  
 Pro Phe Phe Thr Ser Leu Thr Gly Gly Ser Leu Glu Glu Leu Arg Arg  
 1700 1705 1710  
 Val Leu Glu Gln Leu Ile Val Ala His Phe Pro Met Gln Ser Arg Glu  
 1715 1720 1725  
 Phe Pro Pro Gly Thr Pro Arg Phe Asn Asn Tyr Val Asp Cys Met Lys  
 1730 1735 1740  
 Lys Phe Leu Asp Ala Leu Glu Leu Ser Gln Ser Pro Met Leu Leu Glu  
 1745 1750 1755 1760  
 Leu Met Thr Glu Val Leu Cys Arg Glu Gln Gln His Val Met Glu Glu  
 1765 1770 1775  
 Leu Phe Gln Ser Ser Phe Arg Arg Ile Ala Arg Arg Gly Ser Cys Val  
 1780 1785 1790  
 Thr Gln Val Gly Leu Leu Glu Ser Val Tyr Glu Met Phe Arg Lys Asp  
 1795 1800 1805

Asp Pro Arg Leu Ser Phe Thr Arg Gln Ser Phe Val Asp Arg Ser Leu  
 1810 1815 1820  
 Leu Thr Leu Leu Trp His Cys Ser Leu Asp Ala Leu Arg Glu Phe Phe  
 1825 1830 1835 1840  
 Ser Thr Ile Val Val Asp Ala Ile Asp Val Leu Lys Ser Arg Phe Thr  
 1845 1850 1855  
 Lys Leu Asn Glu Ser Thr Phe Asp Thr Gln Ile Thr Lys Lys Met Gly  
 1860 1865 1870  
 Tyr Tyr Lys Ile Leu Asp Val Met Tyr Ser Arg Leu Pro Lys Asp Asp  
 1875 1880 1885  
 Val His Ala Lys Glu Ser Lys Ile Asn Gln Val Phe His Gly Ser Cys  
 1890 1895 1900  
 Ile Thr Glu Gly Asn Glu Leu Thr Lys Thr Leu Ile Lys Leu Cys Tyr  
 1905 1910 1915 1920  
 Asp Ala Phe Thr Glu Asn Met Ala Gly Glu Asn Gln Leu Leu Glu Arg  
 1925 1930 1935  
 Arg Arg Leu Tyr His Cys Ala Ala Tyr Asn Cys Ala Ile Ser Val Ile  
 1940 1945 1950  
 Cys Cys Val Phe Asn Glu Leu Lys Phe Tyr Gln Gly Phe Leu Phe Ser  
 1955 1960 1965  
 Glu Lys Pro Glu Lys Asn Leu Ile Phe Glu Asn Leu Ile Asp Leu  
 1970 1975 1980  
 Lys Arg Arg Tyr Asn Phe Pro Val Glu Val Glu Val Pro Met Glu Arg  
 1985 1990 1995 2000  
 Lys Lys Lys Tyr Ile Glu Ile Arg Lys Glu Ala Arg Glu Ala Ala Asn  
 2005 2010 2015  
 Gly Asp Ser Asp Gly Pro Ser Tyr Met Ser Ser Leu Ser Tyr Leu Ala  
 2020 2025 2030  
 Asp Ser Thr Leu Ser Glu Glu Met Ser Gln Phe Asp Phe Ser Thr Gly  
 2035 2040 2045  
 Val Gln Ser Tyr Ser Tyr Ser Ser Gln Asp Pro Arg Pro Ala Thr Gly  
 2050 2055 2060  
 Arg Phe Arg Arg Arg Glu Gln Arg Asp Pro Thr Val His Asp Asp Val  
 2065 2070 2075 2080  
 Leu Glu Leu Glu Met Asp Glu Leu Asn Arg His Glu Cys Met Ala Pro  
 2085 2090 2095  
 Leu Thr Ala Leu Val Lys His Met His Arg Ser Leu Gly Pro Pro Gln  
 2100 2105 2110  
 Gly Glu Glu Asp Ser Val Pro Arg Asp Leu Pro Ser Trp Met Lys Phe  
 2115 2120 2125  
 Leu His Gly Lys Leu Gly Asn Pro Ile Val Pro Leu Asn Ile Arg Leu  
 2130 2135 2140  
 Phe Leu Ala Lys Leu Val Ile Asn Thr Glu Glu Val Phe Arg Pro Tyr  
 2145 2150 2155 2160  
 Ala Lys His Trp Leu Ser Pro Leu Leu Gln Leu Ala Ala Ser Glu Asn  
 2165 2170 2175  
 Asn Gly Gly Glu Gly Ile His Tyr Met Val Val Glu Ile Val Ala Thr  
 2180 2185 2190  
 Ile Leu Ser Trp Thr Gly Leu Ala Thr Pro Thr Gly Val Pro Lys Asp  
 2195 2200 2205  
 Glu Val Leu Ala Asn Arg Leu Leu Asn Phe Leu Met Lys His Val Phe  
 2210 2215 2220  
 His Pro Lys Arg Ala Val Phe Arg His Asn Leu Glu Ile Ile Lys Thr  
 2225 2230 2235 2240

Leu Val Glu Cys Trp Lys Asp Cys Leu Ser Ile Pro Tyr Arg Leu Ile  
 2245 2250 2255  
 Phe Glu Lys Phe Ser Gly Lys Asp Pro Asn Ser Lys Asp Asn Ser Val  
 2260 2265 2270  
 Gly Ile Gln Leu Leu Gly Ile Val Met Ala Asn Asp Leu Pro Pro Tyr  
 2275 2280 2285  
 Asp Pro Gln Cys Gly Ile Gln Ser Ser Glu Tyr Phe Gln Ala Leu Val  
 2290 2295 2300  
 Asn Asn Met Ser Phe Val Arg Tyr Lys Glu Val Tyr Ala Ala Ala Ala  
 2305 2310 2315 2320  
 Glu Val Leu Gly Leu Ile Leu Arg Tyr Val Met Glu Arg Lys Asn Ile  
 2325 2330 2335  
 Leu Glu Glu Ser Leu Cys Glu Leu Val Ala Lys Gln Leu Lys Gln His  
 2340 2345 2350  
 Gln Asn Thr Met Glu Asp Lys Phe Ile Val Cys Leu Asn Lys Val Thr  
 2355 2360 2365  
 Lys Ser Phe Pro Pro Leu Ala Asp Arg Phe Met Asn Ala Val Phe Phe  
 2370 2375 2380  
 Leu Leu Pro Lys Phe His Gly Val Leu Lys Thr Leu Cys Leu Glu Val  
 2385 2390 2395 2400  
 Val Leu Cys Arg Val Glu Gly Met Thr Glu Leu Tyr Phe Gln Leu Lys  
 2405 2410 2415  
 Ser Lys Asp Phe Val Gln Val Met Arg His Arg Asp Glu Arg Gln Lys  
 2420 2425 2430  
 Val Cys Leu Asp Ile Ile Tyr Lys Met Met Pro Lys Leu Lys Pro Val  
 2435 2440 2445  
 Glu Leu Arg Glu Leu Leu Asn Pro Val Val Glu Phe Val Ser His Pro  
 2450 2455 2460  
 Ser Thr Thr Cys Arg Glu Gln Met Tyr Asn Ile Leu Met Trp Ile His  
 2465 2470 2475 2480  
 Asp Asn Tyr Arg Asp Pro Glu Ser Glu Thr Asp Asn Asp Ser Gln Glu  
 2485 2490 2495  
 Ile Phe Lys Leu Ala Lys Asp Val Leu Ile Gln Gly Leu Ile Asp Glu  
 2500 2505 2510  
 Asn Pro Gly Leu Gln Leu Ile Ile Arg Asn Phe Trp Ser His Glu Thr  
 2515 2520 2525  
 Arg Leu Pro Ser Asn Thr Leu Asp Arg Leu Leu Ala Leu Asn Ser Leu  
 2530 2535 2540  
 Tyr Ser Pro Lys Ile Glu Val His Phe Leu Ser Leu Ala Thr Asn Phe  
 2545 2550 2555 2560  
 Leu Leu Glu Met Thr Ser Met Ser Pro Asp Tyr Pro Asn Pro Met Phe  
 2565 2570 2575  
 Glu His Pro Leu Ser Glu Cys Glu Phe Gln Glu Tyr Thr Ile Asp Ser  
 2580 2585 2590  
 Asp Trp Arg Phe Arg Ser Thr Val Leu Thr Pro Met Phe Val Glu Thr  
 2595 2600 2605  
 Gln Ala Ser Gln Gly Thr Leu Gln Thr Arg Thr Gln Glu Gly Ser Leu  
 2610 2615 2620  
 Ser Ala Arg Trp Pro Val Ala Gly Gln Ile Arg Ala Thr Gln Gln Gln  
 2625 2630 2635 2640  
 His Asp Phe Thr Leu Thr Gln Thr Ala Asp Gly Arg Ser Ser Phe Asp  
 2645 2650 2655  
 Trp Leu Thr Gly Ser Ser Thr Asp Pro Leu Val Asp His Thr Ser Pro  
 2660 2665 2670

Ser Ser Asp Ser Leu Leu Phe Ala His Lys Arg Ser Glu Arg Leu Gln  
 2675 2680 2685  
 Arg Ala Pro Leu Lys Ser Val Gly Pro Asp Phe Gly Lys Lys Arg Leu  
 2690 2695 2700  
 Gly Leu Pro Gly Asp Glu Val Asp Asn Lys Val Lys Gly Ala Ala Gly  
 2705 2710 2715 2720  
 Arg Thr Asp Leu Leu Arg Leu Arg Arg Arg Phe Met Arg Asp Gln Glu  
 2725 2730 2735  
 Lys Leu Ser Leu Met Tyr Ala Arg Lys Gly Val Ala Glu Gln Lys Arg  
 2740 2745 2750  
 Glu Lys Glu Ile Lys Ser Glu Leu Lys Met Lys Gln Asp Ala Gln Val  
 2755 2760 2765  
 Val Leu Tyr Arg Ser Tyr Arg His Gly Asp Leu Pro Asp Ile Gln Ile  
 2770 2775 2780  
 Lys His Ser Ser Leu Ile Thr Pro Leu Gln Ala Val Ala Gln Arg Asp  
 2785 2790 2795 2800  
 Pro Ile Ile Ala Lys Gln Leu Phe Ser Ser Leu Phe Ser Gly Ile Leu  
 2805 2810 2815  
 Lys Glu Met Asp Lys Phe Lys Thr Leu Ser Glu Lys Asn Asn Ile Thr  
 2820 2825 2830  
 Gln Lys Leu Leu Gln Asp Phe Asn Arg Phe Leu Asn Thr Thr Phe Ser  
 2835 2840 2845  
 Phe Phe Pro Pro Phe Val Ser Cys Ile Gln Asp Ile Ser Cys Gln His  
 2850 2855 2860  
 Ala Ala Leu Leu Ser Leu Asp Pro Ala Ala Val Ser Ala Gly Cys Leu  
 2865 2870 2875 2880  
 Ala Ser Leu Gln Gln Pro Val Gly Ile Arg Leu Leu Glu Glu Ala Leu  
 2885 2890 2895  
 Leu Arg Leu Leu Pro Ala Glu Leu Pro Ala Lys Arg Val Arg Gly Lys  
 2900 2905 2910  
 Ala Arg Leu Pro Pro Asp Val Leu Arg Trp Val Glu Leu Ala Lys Leu  
 2915 2920 2925  
 Tyr Arg Ser Ile Gly Glu Tyr Asp Val Leu Arg Gly Ile Phe Thr Ser  
 2930 2935 2940  
 Glu Ile Gly Thr Lys Gln Ile Thr Gln Ser Ala Leu Leu Ala Glu Ala  
 2945 2950 2955 2960  
 Arg Ser Asp Tyr Ser Glu Ala Ala Lys Gln Tyr Asp Glu Ala Leu Asn  
 2965 2970 2975  
 Lys Gln Asp Trp Val Asp Gly Glu Pro Thr Glu Ala Glu Lys Asp Phe  
 2980 2985 2990  
 Trp Glu Leu Ala Ser Leu Asp Cys Tyr Asn His Leu Ala Glu Trp Lys  
 2995 3000 3005  
 Ser Leu Glu Tyr Cys Ser Thr Ala Ser Ile Asp Ser Glu Asn Pro Pro  
 3010 3015 3020  
 Asp Leu Asn Lys Ile Trp Ser Glu Pro Phe Tyr Gln Glu Thr Tyr Leu  
 3025 3030 3035 3040  
 Pro Tyr Met Ile Arg Ser Lys Leu Lys Leu Leu Gln Gly Glu Ala  
 3045 3050 3055  
 Asp Gln Ser Leu Leu Thr Phe Ile Asp Lys Ala Met His Gly Glu Leu  
 3060 3065 3070  
 Gln Lys Ala Ile Leu Glu Leu His Tyr Ser Gln Glu Leu Ser Leu Leu  
 3075 3080 3085  
 Tyr Leu Leu Gln Asp Asp Val Asp Arg Ala Lys Tyr Tyr Ile Gln Asn  
 3090 3095 3100

Gly Ile Gln Ser Phe Met Gln Asn Tyr Ser Ser Ile Asp Val Leu Leu  
 3105 3110 3115 3120  
 His Gln Ser Arg Leu Thr Lys Leu Gln Ser Val Gln Ala Leu Thr Glu  
 3125 3130 3135  
 Ile Gln Glu Phe Ile Ser Phe Ile Ser Lys Gln Gly Asn Leu Ser Ser  
 3140 3145 3150  
 Gln Val Pro Leu Lys Arg Leu Leu Asn Thr Trp Thr Asn Arg Tyr Pro  
 3155 3160 3165  
 Asp Ala Lys Met Asp Pro Met Asn Ile Trp Asp Asp Ile Ile Thr Asn  
 3170 3175 3180  
 Arg Cys Phe Phe Leu Ser Lys Ile Glu Glu Lys Leu Thr Pro Leu Pro  
 3185 3190 3195 3200  
 Glu Asp Asn Ser Met Asn Val Asp Gln Asp Gly Asp Pro Ser Asp Arg  
 3205 3210 3215  
 Met Glu Val Gln Glu Glu Glu Asp Ile Ser Ser Leu Ile Arg Ser  
 3220 3225 3230  
 Cys Lys Phe Ser Met Lys Met Lys Met Ile Asp Ser Ala Arg Lys Gln  
 3235 3240 3245  
 Asn Asn Phe Ser Leu Ala Met Lys Leu Leu Lys Glu Leu His Lys Glu  
 3250 3255 3260  
 Ser Lys Thr Arg Asp Asp Trp Leu Val Ser Trp Val Gln Ser Tyr Cys  
 3265 3270 3275 3280  
 Arg Leu Ser His Cys Arg Ser Arg Ser Gln Gly Cys Ser Glu Gln Val  
 3285 3290 3295  
 Leu Thr Val Leu Lys Thr Val Ser Leu Leu Asp Glu Asn Asn Val Ser  
 3300 3305 3310  
 Ser Tyr Leu Xaa Lys Asn Ile Leu Ala Phe Arg Asp Gln Asn Ile Leu  
 3315 3320 3325  
 Leu Gly Thr Thr Tyr Arg Ile Ile Ala Asn Ala Leu Ser Ser Glu Pro  
 3330 3335 3340  
 Ala Cys Leu Ala Glu Ile Glu Glu Asp Lys Ala Arg Arg Ile Leu Glu  
 3345 3350 3355 3360  
 Leu Ser Gly Ser Ser Ser Glu Asp Ser Glu Lys Val Ile Ala Gly Leu  
 3365 3370 3375  
 Tyr Gln Arg Ala Phe Gln His Leu Ser Glu Ala Val Gln Ala Ala Glu  
 3380 3385 3390  
 Glu Glu Ala Gln Pro Pro Ser Trp Ser Cys Gly Pro Ala Ala Gly Val  
 3395 3400 3405  
 Ile Asp Ala Tyr Met Thr Leu Ala Asp Phe Cys Asp Gln Gln Leu Arg  
 3410 3415 3420  
 Lys Glu Glu Glu Asn Ala Ser Val Thr Asp Ser Ala Glu Leu Gln Ala  
 3425 3430 3435 3440  
 Tyr Pro Ala Leu Val Val Glu Lys Met Leu Lys Ala Leu Lys Leu Asn  
 3445 3450 3455  
 Ser Asn Glu Ala Arg Leu Lys Phe Pro Arg Leu Leu Gln Ile Ile Glu  
 3460 3465 3470  
 Arg Tyr Pro Glu Glu Thr Leu Ser Leu Met Thr Lys Glu Ile Ser Ser  
 3475 3480 3485  
 Val Pro Cys Trp Gln Phe Ile Ser Trp Ile Ser His Met Val Ala Leu  
 3490 3495 3500  
 Leu Asp Lys Asp Gln Ala Val Ala Val Gln His Ser Val Glu Glu Ile  
 3505 3510 3515 3520  
 Thr Asp Asn Tyr Pro Gln Ala Ile Val Tyr Pro Phe Ile Ile Ser Ser  
 3525 3530 3535



Glu Ser Tyr Ser Phe Lys Asp Thr Ser Thr Gly His Lys Asn Lys Glu  
 3540 3545 3550  
 Phe Val Ala Arg Ile Lys Ser Lys Leu Asp Gln Gly Gly Val Ile Gln  
 3555 3560 3565  
 Asp Phe Ile Asn Ala Leu Asp Gln Leu Ser Asn Pro Glu Leu Leu Phe  
 3570 3575 3580  
 Lys Asp Trp Ser Asn Asp Val Arg Ala Glu Leu Ala Lys Thr Pro Val  
 3585 3590 3595 3600  
 Asn Lys Lys Asn Ile Glu Lys Met Tyr Glu Arg Met Tyr Ala Ala Leu  
 3605 3610 3615  
 Gly Asp Pro Lys Ala Pro Gly Leu Gly Ala Phe Arg Arg Lys Phe Ile  
 3620 3625 3630  
 Gln Thr Phe Gly Lys Glu Phe Asp Lys His Phe Gly Lys Gly Gly Ser  
 3635 3640 3645  
 Lys Leu Leu Arg Met Lys Leu Ser Asp Phe Asn Asp Ile Thr Asn Met  
 3650 3655 3660  
 Leu Leu Leu Lys Met Asn Lys Asp Ser Lys Pro Pro Gly Asn Leu Lys  
 3665 3670 3675 3680  
 Glu Cys Ser Pro Trp Met Ser Asp Phe Lys Val Glu Phe Leu Arg Asn  
 3685 3690 3695  
 Glu Leu Glu Ile Pro Gly Gln Tyr Asp Gly Arg Gly Lys Pro Leu Pro  
 3700 3705 3710  
 Glu Tyr His Val Arg Ile Ala Gly Phe Asp Glu Arg Val Thr Val Met  
 3715 3720 3725  
 Ala Ser Leu Arg Arg Pro Lys Arg Ile Ile Ile Arg Gly His Asp Glu  
 3730 3735 3740  
 Arg Glu His Pro Phe Leu Val Lys Gly Gly Glu Asp Leu Arg Gln Asp  
 3745 3750 3755 3760  
 Gln Arg Val Glu Gln Leu Phe Gln Val Met Asn Gly Ile Leu Ala Gln  
 3765 3770 3775  
 Asp Ser Ala Cys Ser Gln Arg Ala Leu Gln Leu Arg Thr Tyr Ser Val  
 3780 3785 3790  
 Val Pro Met Thr Ser Ser Asp Pro Arg Ala Pro Pro Cys Glu Tyr Lys  
 3795 3800 3805  
 Asp Trp Leu Thr Lys Met Ser Gly Lys His Asp Val Gly Ala Tyr Met  
 3810 3815 3820  
 Leu Met Tyr Lys Gly Ala Asn Arg Thr Glu Thr Val Thr Ser Glu Arg  
 3825 3830 3835 3840  
 Lys Arg Glu Ser Lys Val Pro Ala Asp Leu Leu Lys Arg Ala Phe Val  
 3845 3850 3855  
 Arg Met Ser Thr Ser Pro Glu Ala Phe Leu Ala Leu Arg Ser His Phe  
 3860 3865 3870  
 Ala Ser Ser His Ala Leu Ile Cys Ile Ser His Trp Ile Leu Gly Ile  
 3875 3880 3885  
 Gly Asp Arg His Leu Asn Asn Phe Met Val Ala Met Glu Thr Gly Gly  
 3890 3895 3900  
 Val Ile Gly Ile Asp Phe Gly His Ala Phe Gly Ser Ala Thr Gln Phe  
 3905 3910 3915 3920  
 Leu Pro Val Pro Glu Leu Met Pro Phe Arg Leu Thr Arg Gln Phe Ile  
 3925 3930 3935  
 Asn Leu Met Leu Pro Met Lys Glu Thr Gly Leu Met Tyr Ser Ile Met  
 3940 3945 3950  
 Val His Ala Leu Arg Ala Phe Arg Ser Asp Pro Gly Leu Leu Thr Asn  
 3955 3960 3965

Thr Met Asp Val Phe Val Lys Glu Pro Ser Phe Asp Trp Lys Asn Phe  
 3970 3975 3980  
 Glu Gln Lys Met Leu Lys Lys Gly Gly Ser Trp Ile Gln Glu Ile Asn  
 3985 3990 3995 4000  
 Val Ala Glu Lys Asn Trp Tyr Pro Arg Gln Lys Ile Cys Tyr Ala Lys  
 4005 4010 4015  
 Arg Lys Leu Ala Gly Ala Asn Pro Ala Val Ile Thr Cys Asp Glu Leu  
 4020 4025 4030  
 Leu Leu Gly His Glu Lys Ala Pro Ala Phe Arg Asp Tyr Val Ala Val  
 4035 4040 4045  
 Ala Arg Gly Ser Lys Asp His Asn Ile Arg Ala Gln Glu Pro Glu Ser  
 4050 4055 4060  
 Gly Leu Ser Glu Glu Thr Gln Val Lys Cys Ile Met Asp Gln Ala Thr  
 4065 4070 4075 4080  
 Asp Pro Asn Ile Leu Gly Arg Thr Trp Glu Gly Trp Glu Pro Trp Met  
 4085 4090 4095

<210> 35  
 <211> 1014  
 <212> PRT  
 <213> Human

<400> 35

Met Ala Glu Ser Ser Asp Lys Leu Tyr Arg Val Glu Tyr Ala Lys Ser  
 1 5 10 15  
 Gly Arg Ala Ser Cys Lys Lys Cys Ser Glu Ser Ile Pro Lys Asp Ser  
 20 25 30  
 Leu Arg Met Ala Ile Met Val Gln Ser Pro Met Phe Asp Gly Lys Val  
 35 40 45  
 Pro His Trp Tyr His Phe Ser Cys Phe Trp Lys Val Gly His Ser Ile  
 50 55 60  
 Arg His Pro Asp Val Glu Val Asp Gly Phe Ser Glu Leu Arg Trp Asp  
 65 70 75 80  
 Asp Gln Gln Lys Val Lys Lys Thr Ala Glu Ala Gly Gly Val Thr Gly  
 85 90 95  
 Lys Gly Gln Asp Gly Ile Gly Ser Lys Ala Glu Lys Thr Leu Gly Asp  
 100 105 110  
 Phe Ala Ala Glu Tyr Ala Lys Ser Asn Arg Ser Thr Cys Lys Gly Cys  
 115 120 125  
 Met Glu Lys Ile Glu Lys Gly Gln Val Arg Leu Ser Lys Lys Met Val  
 130 135 140  
 Asp Pro Glu Lys Pro Gln Leu Gly Met Ile Asp Arg Trp Tyr His Pro  
 145 150 155 160  
 Gly Cys Phe Val Lys Asn Arg Glu Glu Leu Gly Phe Arg Pro Glu Tyr  
 165 170 175  
 Ser Ala Ser Gln Leu Lys Gly Phe Ser Leu Leu Ala Thr Glu Asp Lys  
 180 185 190  
 Glu Ala Leu Lys Lys Gln Leu Pro Gly Val Lys Ser Glu Gly Lys Arg  
 195 200 205  
 Lys Gly Asp Glu Val Asp Gly Val Asp Glu Val Ala Lys Lys Lys Ser  
 210 215 220  
 Lys Lys Glu Lys Asp Lys Asp Ser Lys Leu Glu Lys Ala Leu Lys Ala  
 225 230 235 240  
 Gln Asn Asp Leu Ile Trp Asn Ile Lys Asp Glu Leu Lys Lys Val Cys  
 245 250 255

Ser Thr Asn Asp Leu Lys Glu Leu Leu Ile Phe Asn Lys Gln Gln Val  
 260 265 270  
 Pro Ser Gly Glu Ser Ala Ile Leu Asp Arg Val Ala Asp Gly Met Val  
 275 280 285  
 Phe Gly Ala Leu Leu Pro Cys Glu Glu Cys Ser Gly Gln Leu Val Phe  
 290 295 300  
 Lys Ser Asp Ala Tyr Tyr Cys Thr Gly Asp Val Thr Ala Trp Thr Lys  
 305 310 315 320  
 Cys Met Val Lys Thr Gln Thr Pro Asn Arg Lys Glu Trp Val Thr Pro  
 325 330 335  
 Lys Glu Phe Arg Glu Ile Ser Tyr Leu Lys Lys Leu Lys Val Lys Lys  
 340 345 350  
 Gln Asp Arg Ile Phe Pro Pro Glu Thr Ser Ala Ser Val Ala Ala Thr  
 355 360 365  
 Pro Pro Pro Ser Thr Ala Ser Ala Pro Ala Ala Val Asn Ser Ser Ala  
 370 375 380  
 Ser Ala Asp Lys Pro Leu Ser Asn Met Lys Ile Leu Thr Leu Gly Lys  
 385 390 395 400  
 Leu Ser Arg Asn Lys Asp Glu Val Lys Ala Met Ile Glu Lys Leu Gly  
 405 410 415  
 Gly Lys Leu Thr Gly Thr Ala Asn Lys Ala Ser Leu Cys Ile Ser Thr  
 420 425 430  
 Lys Lys Glu Val Glu Lys Met Asn Lys Lys Met Glu Glu Val Lys Glu  
 435 440 445  
 Ala Asn Ile Arg Val Val Ser Glu Asp Phe Leu Gln Asp Val Ser Ala  
 450 455 460  
 Ser Thr Lys Ser Leu Gln Glu Leu Phe Leu Ala His Ile Leu Ser Pro  
 465 470 475 480  
 Trp Gly Ala Glu Val Lys Ala Glu Pro Val Glu Val Val Ala Pro Arg  
 485 490 495  
 Gly Lys Ser Gly Ala Ala Leu Ser Lys Lys Ser Lys Gly Gln Val Lys  
 500 505 510  
 Glu Glu Gly Ile Asn Lys Ser Glu Lys Arg Met Lys Leu Thr Leu Lys  
 515 520 525  
 Gly Gly Ala Ala Val Asp Pro Asp Ser Gly Leu Glu His Ser Ala His  
 530 535 540  
 Val Leu Glu Lys Gly Gly Lys Val Phe Ser Ala Thr Leu Gly Leu Val  
 545 550 555 560  
 Asp Ile Val Lys Gly Thr Asn Ser Tyr Tyr Lys Leu Gln Leu Leu Glu  
 565 570 575  
 Asp Asp Lys Glu Asn Arg Tyr Trp Ile Phe Arg Ser Trp Gly Arg Val  
 580 585 590  
 Gly Thr Val Ile Gly Ser Asn Lys Leu Glu Gln Met Pro Ser Lys Glu  
 595 600 605  
 Asp Ala Ile Glu His Phe Met Lys Leu Tyr Glu Glu Lys Thr Gly Asn  
 610 615 620  
 Ala Trp His Ser Lys Asn Phe Thr Lys Tyr Pro Lys Lys Phe Tyr Pro  
 625 630 635 640  
 Leu Glu Ile Asp Tyr Gly Gln Asp Glu Glu Ala Val Lys Lys Leu Thr  
 645 650 655  
 Val Asn Pro Gly Thr Lys Ser Lys Leu Pro Lys Pro Val Gln Asp Leu  
 660 665 670  
 Ile Lys Met Ile Phe Asp Val Glu Ser Met Lys Lys Ala Met Val Glu  
 675 680 685

Tyr Glu Ile Asp Leu Gln Lys Met Pro Leu Gly Lys Leu Ser Lys Arg  
 690 695 700  
 Gln Ile Gln Ala Ala Tyr Ser Ile Leu Ser Glu Val Gln Gln Ala Val  
 705 710 715 720  
 Ser Gln Gly Ser Ser Asp Ser Gln Ile Leu Asp Leu Ser Asn Arg Phe  
 725 730 735  
 Tyr Thr Leu Ile Pro His Asp Phe Gly Met Lys Lys Pro Pro Leu Leu  
 740 745 750  
 Asn Asn Ala Asp Ser Val Gln Ala Lys Val Glu Met Leu Asp Asn Leu  
 755 760 765  
 Leu Asp Ile Glu Val Ala Tyr Ser Leu Leu Arg Gly Gly Ser Asp Asp  
 770 775 780  
 Ser Ser Lys Asp Pro Ile Asp Val Asn Tyr Glu Lys Leu Lys Thr Asp  
 785 790 795 800  
 Ile Lys Val Val Asp Arg Asp Ser Glu Glu Ala Glu Ile Ile Arg Lys  
 805 810 815  
 Tyr Val Lys Asn Thr His Ala Thr Thr His Asn Ala Tyr Asp Leu Glu  
 820 825 830  
 Val Ile Asp Ile Phe Lys Ile Glu Arg Glu Gly Glu Cys Gln Arg Tyr  
 835 840 845  
 Lys Pro Phe Lys Gln Leu His Asn Arg Arg Leu Leu Trp His Gly Ser  
 850 855 860  
 Arg Thr Thr Asn Phe Ala Gly Ile Leu Ser Gln Gly Leu Arg Ile Ala  
 865 870 875 880  
 Pro Pro Glu Ala Pro Val Thr Gly Tyr Met Phe Gly Lys Gly Ile Tyr  
 885 890 895  
 Phe Ala Asp Met Val Ser Lys Ser Ala Asn Tyr Cys His Thr Ser Gln  
 900 905 910  
 Gly Asp Pro Ile Gly Leu Ile Leu Leu Gly Glu Val Ala Leu Gly Asn  
 915 920 925  
 Met Tyr Glu Leu Lys His Ala Ser His Ile Ser Lys Leu Pro Lys Gly  
 930 935 940  
 Lys His Ser Val Lys Gly Leu Gly Lys Thr Thr Pro Asp Pro Ser Ala  
 945 950 955 960  
 Asn Ile Ser Leu Asp Gly Val Asp Val Pro Leu Gly Thr Gly Ile Ser  
 965 970 975  
 Ser Gly Val Asn Asp Thr Ser Leu Leu Tyr Asn Glu Tyr Ile Val Tyr  
 980 985 990  
 Asp Ile Ala Gln Val Asn Leu Lys Tyr Leu Leu Lys Leu Lys Phe Asn  
 995 1000 1005  
 Phe Lys Thr Ser Leu Trp  
 1010

<210> 36  
 <211> 4  
 <212> PRT  
 <213> Human

<400> 36  
 Val Gly Pro Asp  
 1

<210> 37  
 <211> 5  
 <212> PRT

<213> Human

<400> 37

Ile Ser Ala Asp Glu  
1 5

---